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Admission pattern of neonatal intensive care unit in southern Jharkhand -Research study

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ABSTRACT

The neonatal mortality rate at 25.4 deaths per 1,000 live births in India makes it 12th worst among the 52 lower-middle-income countries. There is a wide disparity among the states of India. While Kerala and Goa have neonatal mortality rates of 10 per 1,000 live births, the figure for Bihar and Uttarakhand stands high at 44 per 1,000. Moreover, Uttar Pradesh, Bihar, Jharkhand, Madhya Pradesh and Rajasthan who account for 46 percent of all births, accounts to 57 percent of India's neonatal deaths. This study was a retrospective observational study done at Tertiary Referral centre for paediatrics in Jamshedpur. The current study was aimed to assess the major causes leading to admissions and causes of death in our centre. The study observed that maximum number of babies having respiratory distress (mainly respiratory distress syndrome in preterm) 46% followed by sepsis 14.76%, birth asphyxia 12.69% at the time of admission. Maximum number of death was among babies who have respiratory distress 39.84%. This was followed by babies with Neonatal Sepsis 19.53%, birth asphyxia 15.62%.

Neonatal morbidity and mortality can be reduced with better antenatal and perinatal care, promoting institutional delivery, educating health care worker, early recognition and early referral to tertiary care centre. Hand washing and judicious use of antibiotic can prevent sepsis in tertiary care centre.

Keywords: Neonatal mortality, Preterm, Sepsis, Low birth weight.

INTRODUCTION

The neonatal period (first 28 days of life) is the most vulnerable period with highest mortality at an average global rate of 18 deaths per 1,000 live births in 2017. Comparatively, mortality in age group between 1 month to 1 year age was 12, and between 1 year to 12 year age were 10 deaths per 1,000 live births [1].

Globally, 2.5 million children died in the first month of life in 2017 alone. That is approximately 7,000 neonatal deaths every day, most of which occurred in the first week, with about 1 million dying on the first day and close to 1 million dying within the next six days [2].

Of these, 6.4 lakh neonatal deaths occur in India. The neonatal mortality rate at 25.4 deaths per 1,000 live births in India makes it 12th worst among the 52 lower-middle-income countries. India

is the only major country in the world to have a higher mortality for girls than boys.

There is a wide disparity among the states of India. While Kerala and Goa have neonatal mortality rates of 10 per 1,000 live births, the figure for Bihar and Uttarakhand stands high at 44 per 1,000. Moreover, Uttar Pradesh, Bihar, Madhya Pradesh and Rajasthan who account for 46 percent of all births, accounts to 57 percent of India's neonatal deaths [3].

This data warrants introspecting the admissions in Tertiary Referral centre and their outcome to point out the fallacies and focus on necessary rectification, so as to decrease these figures. The current study was thus aimed to assess the major causes leading to admissions in our Tertiary Referral centre and their causes of death [4].

MATERIAL AND METHOD

This study was a retrospective observational study done at Tertiary Referral centre for paediatrics in Jamshedpur. The NICU at this centre caters to 3 Districts of Jharkhand- East Singhbhum (appx. 25 lakhs population), West Singhbhum (appx. 18 lakhs population), Saraikela Kharsawan (appx.12 lakhs population) and adjoining areas of West Bengal and Orissa (appx. about 10 lakhs population). The NICU is having multipara monitors, neonatal ventilator, radiant warmers, phototherapy (LED type) units and syringe pumps. All the diagnoses were made by their standard definitions [5].

All the babies admitted from October 2018 to March 2019 in NICU were analyzed with respect to their age in days, sex, birth weight, cause of admission, hospital stay and their outcome.

Babies having incomplete data and those babies kept for observation only for less than 24 hours were excluded from the study.

RESULTS

Total 630 neonates were admitted to NICU. Out of 630 babies, 340 were males and 290 were females with male to female ratio of 1.17:1 as shown in Table 1.

Table 2 show distribution of babies according to birth weights admitted. Out of the total admissions, ELBW were 30 (4.76%), VLBW were 150 (23.80%) and LBW were 264 (41.90%) and remaining (29.52%) were normal birth weight neonates [6].

Table 3 shows distribution of NICU admissions depending upon diagnosis. Maximum number of babies having respiratory problem 290 (46%), nearly half of all the babies which includes respiratory distress syndrome in preterm 165 (26.2%) and other causes of respiratory distress in term baby like transient tachypnea of newborn, pneumonia 125 (19.8%). This is followed by sepsis 93 (14.76%), birth asphyxia 80 (12.69%) neonatal jaundice 75 (11.90%), Meconium Aspiration Syndrome 60 (9.52%) and congenital anomaly 15 (2.38%) [7].

Table 1 Gender wise distribution of admission in NICU

Gender	No. of admission	Percentage
Male	340	53.96
Female	290	46

Table 2 Distribution of admission according to birth weight.

Birth Weight	No. Of Admission	Percentage
>2.5kg	186	29.52
LBW	264	41.90
VLBW	150	23.80
ELBW	30	4.76

Table 3 Distribution of Cause for admission in NICU.

Cause of Admission	Numbers	Percentage
Respiratory Distress Syndrome (preterm)	165	26.2
Other Respiratory problem (TTN, pneumonia)	125	19.8
Neonatal Sepsis	93	14.76

MAS	60	9.52
Birth Asphyxia	80	12.69
Neonatal jaundice	75	11.90
Post term	7	1.11
Hypoglycaemia	10	1.58
Congenital anomalies and other	15	2.38

Table 4 shows total death of 60 males and 68 females out of total admissions in NICU. Table 5 depicts number of deaths according to birth weight of admitted cases with maximum number of deaths in Very Low Birth Weight group (35.15%) out of total deaths [8, 9].

Table 6 depicts Maximum number of death amongst babies who have respiratory problem 51 (39.84%). This is followed by babies with Neonatal Sepsis 25 (19.53%), birth asphyxia 20 (15.62%), Neonatal jaundice 3 (2.34%), and congenital anomaly 8 (6.25%).

Table 4 Gender wise distribution of Total deaths.

Gender	No. of death	Percentage
Male	60	46.8
Female	68	53.1

Table 5 Distribution of deaths in various birth weight group.

Birth Weight	Deaths	Percentage
>2.5kg	40	31.2
LBW	20	15.6
VLBW	45	35.15
ELBW	23	17.96

Table 6 Deaths occurring in various causes of admission

Cause of Admission	Deaths	Percentage
Respiratory distress	51	39.84
Neonatal Sepsis	25	19.53
MAS	18	14
Birth Asphyxia	20	15.62
Neonatal jaundice	3	2.34
Post term	1	0.78
Hypoglycaemia	2	1.56
Congenital anomaly	8	6.25

DISCUSSION

Out of total admissions of 630, male to female ratio was 1.17:1, which was similar to NiruPrabha et al., Nandy S et al. and Thakur S et al. and [1,2,3,4]. The male preponderance in admission was also seen in international studies Ugu b nigeria and seyal et al. from Pakistan [5,6].

Maximum number of admission occurred with weight less than 2.5 kg that means low birth weight, accounting to 41.90% of total admissions, similar to NiruPrabha et al. and Thammanna PS et al. [1,2,5].

The major burden of cause of admission in this was noted to be from respiratory problem mainly in Preterm, amounting to 46% of all. This can be

attributed to low socio-economic status, poor maternal health condition and irregular antenatal visits. Followed by Neonatal sepsis 14.76%, Birth asphyxia 12.69% and Neonatal jaundice 11.90%.

Mortality rate in this study was found to be of 20.31% .The death status among the female babies surpassed that of male, with total female baby death of 68 (53.1%) and male 60 (46.8%). Most deaths were seen in VLBW weight group, with highest percentage of 35.15% of total deaths. Followed by >2.5kg weight group with total 40 deaths, which is 21.5% of total admissions in this group. Only 7.5% of total admissions of LBW died.

Most of the death was seen in respiratory distress mainly in preterm 51(39.84%), followed by Neonatal sepsis 19.53% and Birth asphyxia

15.62%. Which was similar to Prasad V et al. 18.8% [6,8,9] , in contrast to this low mortality reported by NiruPrabha et al. 13% [1], Yattoo GH et al. 9.7% [7] and 8 % by Narayan R[8]. This disparity in data may be due to neonatal mortality rate in rural area is twice that in urban areas, as there is wide socioeconomic difference in India [9].

In India, Kerala and Goa have neonatal mortality rates of ten per 1,000 live births, the figure for Bihar and Uttarakhand stands at 44 per 1,000. Moreover, Uttar Pradesh, Bihar, Madhya Pradesh and Rajasthan who account for 46 percent of all births, has 57 percent of India's neonatal deaths. This clearly shows that while some parts are really coping up well with literacy and family planning, others need significant attention to decrease neonatal death from their state government on reforms. Therefore, the Sustainable Development Goal (SDG) report clearly states that India is quite far from meeting the commitment to lowering the neonatal mortality rates to 12 for every 1000. Even to cut the current rate in half in the next 12 years, a higher amount of government attention and citizen involvement is required. The rates would come down if measures were taken to improve the healthcare system by adopting better hygienic condition, use of disinfectants, initiate breastfeeding within the hour and good nutrition.

The major reason of high mortality rate is due to lack of availability and accessibility of well-trained health workers, clean water, proper nutrition and education about the dos and don'ts of childcare. There is also a desperate need to create awareness about sex discrimination, where the girl child is unwanted. By making lifesaving supports available, these deaths can be prevented.

UNICEF is launching a global campaign called "Every Child ALIVE," to demand and deliver solutions on behalf of the world's newborns. This campaign hopes to be helpful as a guide and a yardstick for the governments, health care providers, donors, the private sector and families of

different nations to keep every child born alive by adopting the following measures.

Firstly, recruiting and training sufficient doctors and nurses with expertise in maternal and newborn care. Secondly, functional health facilities equipped with water, disinfectant and electricity, within the reach of every mother and baby, a major area of concern for India. Thirdly, making it a priority to provide every mother and baby with the life-saving drugs and equipment needed for a healthy start in life; and lastly empowering adolescent girls, mothers and families to demand and receive quality health care.

It is estimated that nearly one fourth of all newborn deaths are caused by birth asphyxia. Following improvement in antenatal, perinatal and obstetrical care in most of the developed countries the incidence of birth asphyxia has reduced significantly.

CONCLUSION

Prematurity, respiratory distress, birth asphyxia, neonatal sepsis, meconium aspiration syndrome, were the leading causes of morbidity and mortality in tertiary health centre. These mortalities can be reduced with better antenatal and perinatal care, promoting institutional delivery, educating health care worker, early recognition and early referral to tertiary care centre with timely intervention. Hand washing and judicious use of antibiotic can prevent sepsis in health centre.

Conflict of Interests

There is no conflict of interests to this publication.

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